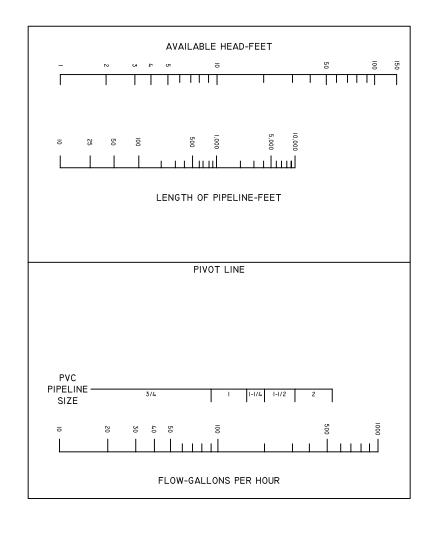


GRAVITY PIPELINE AND TANK DESIGN-Continuous Flow

Source to #1 #1 to #2 #2 to #3 #3 to #4 15 15 15 15 15 15 earn line is higher than the line being designes) 4 x 0.5) – Line 5 then divide by 3 [Cer)	4) PVC Pipe Diameter (in.)	3) Length of Pipe to Install (ft.)	2) Design Flow Rate in Pipeline (g/h)	designed to the water source or tank above one being designed	1) Length of Pipe From Tank being	(min. 4 ft., if > 115 ft.add pressure reducer)	0) Total Available Head (ft.) =	9) Elevation of the Tank	the tank directly above	8) Elev. of the Water Source or	For the Design Flow Rate in the Pipeline (Line 12) use the greater of Line 6 or Line 7	7) Replenishment Rate (g/h)	Check the Replenishment Rate (Line 4 x 0.5) – Line 5 then divide by 3	use the higher rate for all upstream lines)	(If a flow rate required from a downstream line is higher than the line being designed then	6) Flow Rate in Pipeline $2/(g/h)$	5) Tank Capacity (g)	4) Water Needs $(g/h) = $	3) Daily Consumption 1/ (g/hd/h) x	2) Number of Cows or Horses (hd)	1) Pipe and Tank Sou
#2 #2 to #3 # 15 15 16 17 18 19 19 10 10 10 10 10 10 10 10				one being design)					Line 12) use the g		0.5) – Line 5 ther		n line is higher th				15 15		urce to #1 #1 to
				led							greater of Line (n divide by 3		an the line bein				15		#2 #2 to #3 #

PIPELINE DESIGN CHART FOR LIVESTOCK WATER FACILITIES

(plot lines on this chart, see KYFOTG IV for instructions)



 $1/\operatorname{From}$ Table 1 FOTG for beef, dairy, and horses use 15 gal/hd/hr. $2/\operatorname{From}$ Table 2 FOTG

DESIGN PROCEDURE

- 1) This design is for a gravity system using tanks in line with continuous flow on all tanks with a pond or spring as a water source.
- 2) GPS, be sure to get shots close enough together to depict the ground line not the horizontal distance. Be sure to draw a plan view of the layout to The design survey shall have the elevation of the reliable water line in the pond or the elevation of the water in the spring box and the elevation of each watering facility to be installed. A GPS is not accurate enough for this and it cannot be taken from a topographic map. You will also need to tape along accompany your survey. the ground line of the proposed pipeline to determine how much pipe to design for. This can be done with a GPS with a backpack antenna. If you use a
- 3) Determine from the landowner the number of cattle or horses that will be using each tank and the volume of each tank.
- 4 designed then use the higher rate for all upstream segments. Using the total available head (line 10), length of pipe (line 11), and flow rate in pipe (line the difference in elevation of the tank being designed and the one above it. The length of pipe used in the design is the distance from the source to tank #1 or the distance from the tank being designed and the tank above it. If a flow rate required from a downstream line is higher than the line being 12), determine the pipe size of each segment. Fill in the blanks on the Pipeline and Tank Design chart. The total available head will be the difference in the elevation of the source and the first tank or
- 5) Schedule 40 PVC pipe is most commonly used for these facilities. But in the event that another type of pipe (that meets the standards) is to be used, list the length and type of pipe material used in the Bill of Materials on the drawing.
- 9 Any time the gained head produces a total available head (line 10) greater than 115 feet (50 psi), a pressure reducer should be installed at the watering
- ۲ When the water source is a spring, the minimum pipe size from the spring to the first tank shall be as shown in the Spring Development (Code 574)
- ∞ Give a copy of the front sheet only to the land owner or contractor. The engineering job class will be based on the pressure, which is the total available head divided by 2.31, and the length of pipe to the farthest tank.

CONSTRUCTION CHECK

	Source to #1	#1-#2	#2-#3	#3-#4	
Length of Pipe (ft.)(measured) Diameter of Pipe (in.) Description of Pipe Min. Cover					
	#1	#2	#3	#4	
Description of Tank (Gals.) Slev. of Tank Min. Projection of HUA					

To the best of my professional knowledge, judgment, and belief the installed practice meets NRCS standards.

		Title
		Date
09\05	(back)	KY-ENG-516E

Name